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ATTACHMENTS

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5.0 HOOKS

5.1 SCOPE

This section applies to hooks installed on cranes or hoists and implements the requirements of ASME B30.10. For rigging hooks see paragraph 10.6.

5.2 NEW HOOKS

When new hooks are purchased, pertinent requirements of ASME B30.10 shall be specified in the procurement document.

5.2.1 Performance Tests

Performance testing of hooks shall not be required except where necessary to conform to the requirements for the equipment of which they are a part.

When tests are specified, documentation shall be uniquely identified to the hook, by serial number, or other identifier.

5.3 THROAT LATCHES

A latch, or mousing, bridges the throat opening of the hook for the purpose of retaining slings, chains, or similar parts under slack conditions and is not intended to support the load. Mousing shall not be used to secure the hook throat in manlift operations.

Latch equipped hooks shall be used for all hoisting and rigging (H&R) operations unless the application makes use of the latch impractical, or unsafe. The absence of a hook throat latch is not indiscriminately allowed. Unless a specific impractical or unsafe situation can be substantiated, the hook latch is mandatory.

Questions concerning requirements for throat latches shall be resolved by the responsible safety organization.

5.4 INSPECTION

5.4.1 Inspection Classification

1. **Initial Inspection**. Before initial use, all new and repaired hooks shall be inspected to ensure compliance with the applicable provisions of ASME B30.10, HOOKS.

2. **Daily Inspection**. Hook visual inspection shall be conducted daily (before use) by the operator or other designated person to identify the following:

    a. Cracks, nicks, gouges

    b. Deformation

    c. Damage from chemicals

    d. Damage or malfunction of the throat latch, if provided.

3. **Classifications**. There shall be two general inspection classifications based on intervals at which examination shall be performed. The classifications are designated *frequent* and *periodic*, with intervals between examinations as defined below.

5.4.2 Frequent Inspection Interval

Visual examinations by the operator or other designated person with records not required:

1. Normal service—monthly
2. Heavy service—weekly to monthly
3. Severe service—daily to weekly.

Hook Service Classifications

Service, normal. Service that involves operating at less than 85% of rated load except for isolated instances

Service, heavy. Service that involves operating at 85% to 100% of rated load as a regular specified procedure

Service, severe. Heavy service coupled with abnormal operating condition

5.4.3 Periodic Inspection Interval

Visual inspections shall be performed by a qualified inspector who shall record apparent external conditions to provide the basis for continuing evaluation:

1. **Normal service**. Yearly, with equipment in place.

2. **Heavy service**. Semiannually, with equipment in place unless external conditions indicate that disassembly should be done to permit detailed inspection.

3. **Severe service**. Quarterly, as in heavy service, except that detailed inspection may show the need for nondestructive type testing.

5.4.4 Frequent Inspection

1. Frequent inspection shall include observations during operation.

2. A designated person shall determine whether conditions found during the inspection constitute a hazard and whether a more detailed inspection is required.

3. Hooks shall be inspected for the following items and conditions:

    a. Distortion, such as bending, twisting, or increased throat opening

    b. Wear

    c. Cracks, nicks, or gouges

    d. Latch engagement, damaged or malfunctioning latch (if provided)

e. Hook attachment and securing means.

5.4.5 Monthly and Periodic Inspections (Records Required)

1. Monthly and periodic inspections shall include the requirements of Frequent Inspection (paragraph 5.4.4), shall be done by a qualified person, and shall be documented.

2. A monthly documented hook inspection is required on overhead, gantry, and mobile cranes. Monthly hook inspection is a visual inspection for deformation, throat opening, and wear. Measurements are only required if the inspector finds evidence of distortion or damage. Monthly hook inspections on such cranes should be done in conjunction with the monthly wire rope or chain inspection. On manually operated lever hoists, overhead (underhung) hoists, jibs, and monorail systems, periodic hook inspection is required, but monthly hook inspection is not required.

3. When monthly and periodic inspection fall in the same month, only the periodic documented hook inspection is required that month.

4. Hooks having any of the following conditions shall be discarded.

   a. **Deformation**. Any bending or twisting exceeding 10 degrees from the plane of the unbent hook, unless otherwise directed by the hook manufacturer.

   b. **Throat Opening**. Any distortion causing an increase in throat opening exceeding 15 percent or as otherwise directed by the hook manufacturer.

   c. **Wear**. Any wear exceeding 10 percent of the original section dimension of the hook or its load pin or as otherwise directed by the hook manufacturer.

   d. **Cracks**. Any visible crack.

5.4.6 Inspection Records

For documented inspections, inspection records shall include the date of inspection, the signature of the person who performed the inspection, and the serial number, or other identifier, of the hook inspected. The most recent inspection records shall be retained in the equipment maintenance file. Following is a summary of inspection record requirements.

1. **Initial Inspection**. A record of the initial inspection shall be made.

2. **Pre-use and Frequent Inspection**. No records are required.

3. **Monthly and Periodic Inspection**. A record of monthly and/or periodic inspections shall be made.

5.5 NONDESTRUCTIVE TESTING

5.5.1 New Hooks

New crane/hoist hooks that will be assigned to critical lift service should receive an NDT by the hook manufacturer. New crane/hoist hooks that will be assigned to heavy or severe service should

receive an NDT by the hook manufacturer. The NDT method, acceptance criteria, and documentation requirements should be determined before the hook is purchased and specified on the purchase requisition.

CAUTION: Hooks purchased without an acceptable NDT may not pass applicable in-service NDT requirements.

5.5.2 Existing Hooks

Existing crane/hoist hooks with a rated load greater than or equal to 10 tons and assigned to heavy or severe service shall receive an NDT by a qualified inspector at the following intervals:

1. **Heavy service**. Annually

2. **Severe service**. Semi-annually (every 6 months)

NOTE: Hooks in normal service do not routinely require NDT. See paragraph 5.5.2.1 and 5.5.2.2.

Hook Service Classifications

Normal service. Service that involves operating at less than 85% of rated load except for isolated instances

Heavy service. Service that involves operating at 85% to 100% of rated load as a regular specified procedure

Severe service. Heavy service coupled with abnormal operating conditions

5.5.2.1 Hooks in Normal Service. Hooks in normal service shall receive NDT for site-specific reasons if deemed appropriate by facility management, the equipment custodian, a qualified inspector, or another designated person.

5.5.2.2 Hooks with Potential Defects. If visual examination reveals a surface intersecting discontinuity, twist, increased throat opening, or any other potential defect, NDT shall be employed to further evaluate the hook, regardless of the hook's service classification or rated load.

5.5.2.3 Hook NDT Records. Dated and signed NDT records, traceable to the hook by serial number or other identifier, shall be kept on file as long as the hook remains in service or is accessible for service. NDT records shall be readily available to appointed personnel.

5.5.2.4 Hook NDT Methods. Magnetic particle testing or liquid penetrant testing methods shall be utilized to inspect for surface intersecting discontinuities (i.e., stress or fatigue cracks).

1. NDT shall be done in accordance with the following ASTM standards:

   a. ASTM E-709, *Standard Practice for Magnetic Particle Examination*

   b. ASTM E-165, *Standard Practice for Liquid Penetrant Inspection Method*

2. For magnetic particle testing, a coil, yoke, or wet technique should be used to eliminate the possibility of prod burns or arc strikes.

3. NDT should be done with the hook in place unless conditions indicate that disassembly for thread or shank inspection is necessary.

5.5.2.5 NDT Acceptance Criteria. The following relevant indications shall be documented and resolved by a designated person:

1. Arc strikes (welding/electrical)

2. Surface intersecting discontinuities 0.25 inch long or longer.

5.5.2.6 Discontinuity Removal. Discontinuities may be removed by limited and controlled grinding (see Attachments 5.1-1 and 5.1-2).

5.5.2.7 NDT After Grinding. Hooks shall be reexamined by NDT to verify removal of relevant indications.

ATTACHMENT 5.1-1.REMOVAL OF SHANK HOOK DISCONTINUITITES

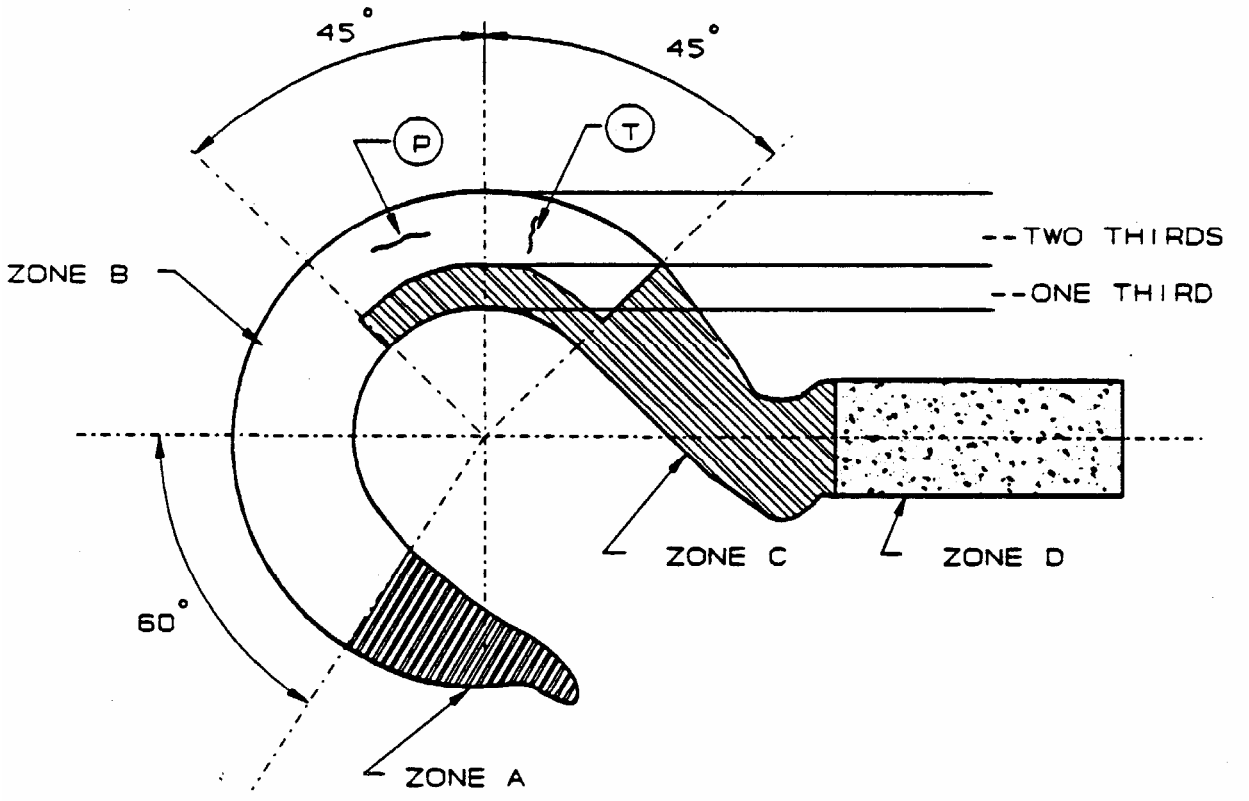
(throat latch omitted for clarity)

Two directions of discontinuities are labeled on the drawing below as “P” and “T”. Discontinuity P parallels the contour of the hook and is considered nonserious in nature and does not require removal. Discontinuity T is transverse to the contour of the hook and is more serious in nature. Discontinuity T, when occurring in Zones B, C, or D, may reduce the longevity of the hook.

Discontinuities may be removed by grinding longitudinally following the contour of the hook to produce a smooth, gently undulating surface. In Zones B and D grinding shall not reduce the original hook dimension by more than 10 percent. In Zone C, grinding shall not reduce the original dimension by more than 5 percent.

Under normal and proper application, Zone A is an unstressed zone; therefore, it is not required that discontinuities in Zone A be ground out.

NOTE: If the hook manufacturer recommends less grinding than this instruction, the hook manufacturer's recommendation shall be followed.



ATTACHMENT 5.1-2 REMOVAL OF EYE HOOK DISCONTINUITITES

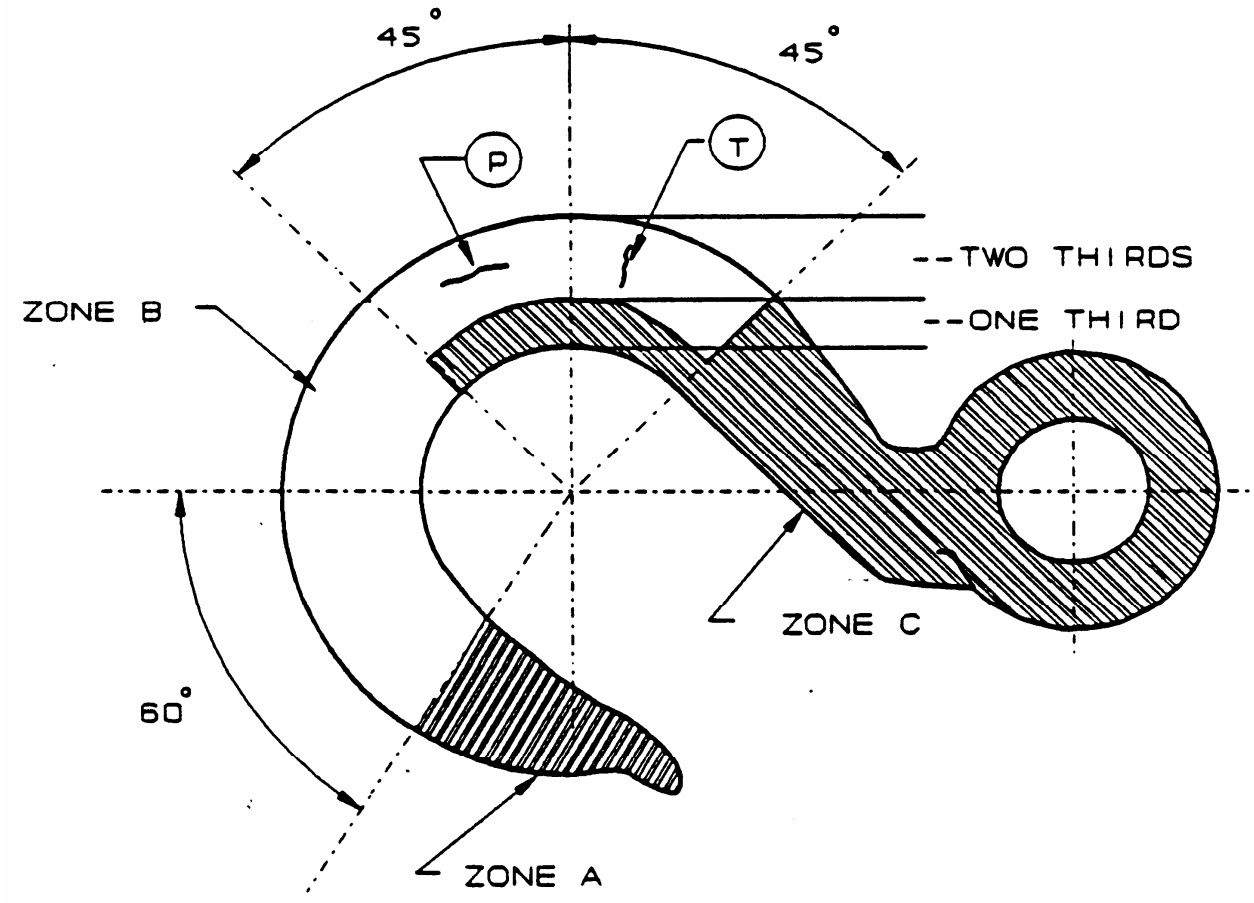
(throat latch omitted for clarity).

Two directions of discontinuities are labeled on the drawing below as "P" and "T." Discontinuity P parallels the contour of the hook and is considered nonserious in nature and does not require removal. Discontinuity T is transverse to the contour of the hook and is more serious in nature. Discontinuity T, when occurring in Zones B or C, may reduce the longevity of the hook.

Discontinuities may be removed by grinding longitudinally following the contour of the hook to produce a smooth, gently undulating surface. In Zone B grinding shall not reduce the original hook dimension by more than 10 percent. In Zone C, grinding shall not reduce the original dimension by more than 5 percent.

Under normal and proper application, Zone A is an unstressed zone; therefore, it is not required that discontinuities in Zone A be ground out.

NOTE: If the hook manufacturer recommends less grinding than this instruction, the hook manufacturer's recommendation shall be followed.



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